

1. How do you know if all the oil from the BP oil spill has been removed from the Gulf? (Bellview Middle School; Pensacola, FL)

This will be difficult to determine since a lot of oil is at the bottom of the gulf. Also, much of it was treated with a dispersant that caused the oil to break into microscopic particles, which would make it almost impossible to find and collect. Oil degrades over time with exposure to sunlight and microbes, but it is possible that some of the oil has been buried under sediments and may resurface some day. But the vast majority of oil from this spill is gone. There are still clean-up crews operating at various locations on the coast and monitoring for oil. Occasionally, oil is sighted, but it is not necessarily oil from the BP spill. Remember, there is a lot of oil and gas activity on the coast, and there are small spills all the time. There are also natural seeps of crude oil from the bottom of the Gulf. We may never know if ALL of the oil has been removed, but we are confident that the seafood is currently safe, and the amount of oil still in the environment is nearly undetectable.

2. Marsh grasses help prevent coastal erosion, but are there artificial ways, such as rock jetties, that are effective in preventing erosion? (Josie; Covington High School; Covington, LA)

Rocks are sometimes used as breakwaters, wave breaks, and for protection of banks and shorelines. They can be useful, but their project life is fairly short. Rocks tend to sink into the soft mud over time, so shoreline protection projects usually need new rocks added after twenty years or so. This can get expensive. Also, rocks are not naturally found in the delta. Our coastal wetlands, indeed all of southern Louisiana, is made of sand, silt, and clay, not rocks. And so we prefer to restore the coast with materials that would naturally occur there. If we restore ridges, barrier islands, and marsh platforms with dredged sediments, then plants can colonize these areas and we'll have healthy productive habitats for fish and wildlife that protect us from storms, instead of just lines of rocks. This is a major misconception and unfortunately focuses people's attention on remedies that will not address the main cause of land loss, which is land sinking, caused by settling and compaction of the sediment laid down by the river in the delta. To counteract sinking, new sediment must be added to the soil surface—this happened naturally in the past as tides and currents and spring flooding brought in new sediment. When levees were build along the Mississippi River, overbank flooding and sediment delivery stopped, so that there was only sinking occurring. The sinking leads to so much inundation by water that plants cannot survive.

3. What new precautions are in place to protect the Gulf from future oil spills? (Evans Elementary School; Sylvania, AL)

The federal agency that regulates offshore drilling, the Minerals Management Service, was reorganized after the spill and given a new name, the Bureau of Ocean Energy Management (BOEM). Under this reorganization, they are looking at all of the existing regulations and redeveloping them to maximize safety. There will be new rules regarding the infamous "blow-out preventers" and probably other, more technical changes to exploration, drilling, and production. You should contact someone in the BOEM for specifics. I am not aware of any new precautions in place in state waters.

4. What makes the sand of the Gulf beach crystal white as compared with the Atlantic beaches that have grey sand? (Jackie; Huntsville High School; Huntsville, AL)

This has to do with geology and a little biology. The color of beach sand depends on the source material, which is usually rock from the continental crust. In the case of Gulf beaches, Florida is mostly limestone, but the crushed calcium carbonate shells of millions of years of marine mollusks contribute a lot of that white color. Every beach is different, though, and sometimes even nearby adjacent beaches have completely different colored sand, especially where there might be volcanic material. In some locations, there are black sand beaches formed from volcanic lava, for example, in Hawaii. In other places, sand is created from coral or sea shells and can range in color from white to pink.

5. How much of the gulf environmental clean-up of the oil spill was handled by nature and not by BP? (J.H. Phillips Academy, Birmingham City Schools; Birmingham, AL)

Of the 4.9 million barrels spilled, about 800,000 barrels were collected. That left 4.1 million barrels that was not collected. We don't know the precise proportion remaining, but much of the uncollected oil is being naturally degraded by oil-eating bacteria. It's hard to give an exact percentage, but I think it's safe to say that nature does more than most folks realize. Oil begins to degrade as soon as sunlight hits it, and there are naturally-occurring microbes that consume crude oil and break it down into harmless constituents. The dispersants used in deep water by BP allowed the oil to disperse into smaller droplets, making it easier for chemical and biological action to break it down.

6. Has there been a forecast of how long it will take to completely deplete our coastal lands and marshes at the present speed of erosion? (Paul; Lake Forest Charter School; New Orleans, LA)

It's very hard to make this forecast. For one thing, the rate of land loss has been variable. We lost a lot of land in the 1970s and 80s, and the rate seems to have slowed a little recently. Also, some areas will disappear faster than others due to different factors that vary along the coast. It's not like the entire coast will disappear at the same speed. So it's hard to have confidence in predicting the future rate of loss. Will it be faster or slower than it has been in the past? Also, what is meant by "completely" depleting our coastal land? We're certainly going to lose a lot more land unless we get very serious about restoration. But there will still be some persistent wetlands, ridges, islands, and communities with levees. If there is no restoration, coastal land loss will make it more and more difficult to maintain communities here year after year. Flooding will become more frequent. Different people will reach their breaking point and move away at different times, but it's very hard to predict human behavior. As for the physical landscape, take another look at the Think Again video. There is a great animation in there that shows predicted land loss through the year 2040.

7. How will the oil bio-magnification affect the fishing industry and the seafood we eat? (Jenny; Lake Region High School; Winter Haven, FL)

Fortunately, fish (and most animals) have the ability to metabolize constituents of crude oil. Oil is therefore unlikely to bio-accumulate or bio-magnify. Make no mistake, fresh oil is definitely toxic and

this spill killed a lot of wildlife, but animals that ingested non-lethal amounts of oil should have been able to metabolize it. Toxicity would not be passed up the food chain (as it is with some other pollutants such as heavy metals that cannot be metabolized). Scientists are also studying how larval (young) fish were affected, but it may be several years before we have a complete answer about long-term effects.

8. Will the ecosystem ever get back to the way it was, and will I be able to fish and crab like I used to do? (Katie, Maplewood Middle School; Sulphur, LA)

The Louisiana coastal zone is very dynamic, meaning it is constantly changing, always has, always will. That's its nature. The coast probably won't ever be exactly like it was in the recent past. However, with restoration, some areas may be returned to a more healthy status that will support marine life and wildlife. Currently, the seafood coming from the Gulf of Mexico is safe. There is more testing of seafood quality than ever before. The ecosystem is already mostly back to the way it was, and you should feel free to fish and crab all you want. (You should look into the issue of mercury in fish, but that is not related to the spill.)

9. Can we change the flow of the Mississippi to slow coastal erosion? (Folahan; N. P. Trist Middle School; Meraux, LA)

This is really two questions in one. First, is it possible to change the flow of the river? And second, if we could change the flow of the river, would it slow coastal erosion? The answer to the second question is yes. Although scientists differ on how much land the river can build when we let it flow into the wetlands, most agree that it would at least slow the rate of land loss. This would depend on how much of the river's flow would be released, which brings us back to the first question. Yes, it is possible to divert a small percentage of the river's flow into the wetlands. In fact we already have two such diversions in operation; the Davis Pond Diversion on the westbank near Waggaman, and the Caernarvon Diversion on the east bank near Violet. But these are relatively small diversions. When flowing fully, each is less than 2% of the river's average flow. Would a bigger diversion work better? Well, the bigger the diversion, the more freshwater, nutrients, and sediment it would move. But there is a cost. Introducing large quantities of river water into the estuaries has the potential to flood communities and drastically alter habitats for wildlife and fisheries. It doesn't make sense to flood people in the name of restoration. Also, we need to leave enough water in the current river channel so that ships can make it to port, otherwise we risk destroying a huge economic engine for the region. Scientists are working hard to find the "sweet spot" – the amount of water we can safely divert from the river to help slow wetland loss and maybe even build some new land without destroying fisheries and without flooding coastal communities.

10. How can we as students stay informed about the consequences of the Gulf Oil spill? (Benjamin, Pickering High School; Leesville, LA)

You can stay informed by going to official sources of information that report findings related to the oil spill. Government agencies have websites that have a lot of information that is being constantly updated. There are excellent resources about the spill on the websites of the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA). By going to official

sources of information, you can be better informed about the real story. There are many on-going research projects being carried out by government agencies and university scientists that will be published as reports and articles; summaries for the public will be made available through their websites. LPB also has a site called GulfWatch at <http://www.publicmediaexchange.org/> where you can get audio and video reports about activity in the Gulf.

11. Berms and mangroves were mentioned in the video. What are they? (Jasmine, Providence Middle School; Huntsville, AL)

A berm is a barrier made of earth or sand, much like a levee. A mangrove is a type of wetland plant that is capable of living in areas of high salinity. In Louisiana, we have the black mangrove, which reaches its northernmost limit here; it is found throughout the Caribbean, Central America, and parts of South America. Mangroves can be large trees and mangrove forests are common in tropical regions, but Louisiana's climate is a bit too cold for mangroves to thrive and make forests. We have mangroves on the coast, but they stay fairly small to do cold damage most winters. They look like shrubs.

12. Has the loss of wetlands slowed down due to the new diversion projects that have been implemented in the last two years? (Jessica; Slidell Jr. High School; Slidell, LA)

I'm not aware of any new diversion projects implemented in the last two years, but if you are referring to the Davis Pond and Caernarvon diversions, I would say their effect on wetlands loss has been minimal. But remember, these two diversions were not designed to move sediments into the wetlands. On the contrary, they were designed to just move freshwater in order to combat saltwater intrusion. In theory, sediment diversions will create new land, depending on how much sediment is transported and the dimensions of the receiving basin (where the sediment goes). Future diversions will be engineered specifically to move as much sediment as possible into the wetlands, and should have more of an effect on land loss.

13. Why isn't there a place to sift out and filter the Mississippi water before it reaches the Gulf and causes dead zones? (Camille; St. Pius Elementary School; Lafayette, LA)

That's actually a service that floodplain and coastal wetlands provide. However, this function only occurs where the floodwaters can reach the wetlands and filter through them. Because levees have been built along the entire lower portion of the Mississippi River, the floodwaters cannot flow through the wetlands and instead is shot out into the Gulf into deep water and bypasses most of the wetlands. If the river could be reconnected to the delta wetlands, the marshes and swamps could filter out a lot of the nutrients, which would help keep them healthy and productive. The nutrients (mostly nitrogen, some phosphorus) are dissolved in the water, so it would be very difficult to filter them out. Wetland plants do a pretty good job of taking up these nutrients, but you would need an extremely large area of wetlands and a very long contact time for the plants to take up enough nutrients to make a dent in the dead zone. A better approach would be to reduce the amount of nutrients going into the water in the first place.

14. Is it safe now, more than a year from the oil spill, to eat seafood from the Gulf Coast? Has tourism recovered? (Catherine; St. James Middle School; Myrtle Beach, SC)

Yes, the gulf seafood is safe. More testing of the seafood is taking place than ever before, making it probably the safest seafood in the world right now. Scientists and food safety experts are testing the seafood out at sea, when it comes to the docks, at the markets, and off the shelves. It is safe. (And it is delicious!) Unfortunately, the public perception is that gulf seafood is tainted. So it doesn't matter how safe and delicious it is. The fishermen will still go out of business if no one wants to buy the product, even if it is a great product. So we have to battle public perception, very much like what the tourism industry is going through. I don't know if the numbers of tourists are up to pre-spill numbers yet. Hopefully the tourism industry will make a full recovery soon. I just spent a weekend in Pensacola, and the beach was gorgeous.